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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/806,662

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Tadao Kikumoto

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EXAMINER

YEN, ERIC L

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/806,662	Applicant(s) KIKUMOTO, TADAO	
	Examiner ERIC YEN	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the Office Action mailed 4/10/08, applicant has submitted an amendment filed 4/10/08.

Claims 1, 37-38 are amended. Claims 45-46 have been added.

Response to Arguments

2. Applicant's arguments filed 8/8/08 have been fully considered but they are not persuasive.

As discussed during the interview, there are a number of characteristics of the claim that allow them to be read on by Katoh. Applicant has amended the claims, but the claim scope is still broad enough to be read on by Katoh. In particular, the first particular the claims are directed to a vocoder system but since the vocoder feature only appears in the preamble it does not have patentable weight without being referred to by the body of the claim. Also, the other feature of applicant's invention discussed during the interview that appears to distinguish from Katoh was the part where applicant is modifying each instantaneous center frequency independent of any other frequencies in the frequency spectrum. Katoh appears to teach where the values at instantaneous frequencies in the frequency spectrum are shifted. This also appears to read on the claim language because the ultimate output still has values at each of the frequencies that the initial signal is before it was changed (i.e., shifted). Applicant's representative

Art Unit: 2626

and the examiner looked at other prior art references where the shifting placed the new values in a frequency domain signal at different frequencies than the initial signal.

Applicant's representative noted that this shifting isn't "modulation", but "modulating" can generally be interpreted as any change from one value to another. The fact that the modulation is something to the effect of "set this frequency's amplitude to the value of that frequency's amplitude" could still be modulation in this sense because it is a changing from one amplitude to another amplitude at a given frequency in a frequency domain signal.

Regarding applicant's arguments:

As per Claim 1, applicant argues that Katoh does not teach or suggest "formant detection means for detecting formant characteristics of a first musical tone signal", because Katoh's "musical tone is synthesized by controlling harmonic components of a depressed key in accordance with one of various fixed formats", and "because Katoh is directed towards synthesizing a musical tone in accordance with a fixed formant...

Katoh does not disclose... 'formant detection means for detecting formant characteristics of a first musical tone signal'" (Amendment, page 10).

The examiner respectfully disagrees, for reasons conceptually similar to one point discussed above. Specifically, while the system is a vocoder, "vocoder" does not have patentable weight in the claims. This is relevant because vocoders generally have an audible (i.e., speech, music, etc.) input and analyzes the audible input. This is more than likely what applicant intends to mean by "formant detection", specifically that an

Art Unit: 2626

audible input is analyzed and its formants in its frequency spectrum are identified.

However, the claim language recites “formant detection means for detecting formant characteristics of a first musical tone signal”. As recited, “formant characteristics of a musical tone signal” are not necessarily formant characteristics of an analyzed input signal. If the depressed keys indicate what formants the “output signal” is supposed to have and the output signal is musical in nature, then the data telling the system “formant characteristics” of “a first musical tone signal” which are detected from the depressed key inputs. Therefore, further clarifying that the formant detection is detection from analyzing a first input musical tone signal, or something to that effect, would distinguish the claims from Katoh.

Applicant then argues Katoh does not teach or suggest “division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed”, referring to Table 1, because “the cited Table 1 contains frequency numbers of keys of the musical instrument”, “the frequency numbers represent tone pitches of the keys in units of cents, with the tone pitch of the lowest key... being used as a reference point” (Amendment, page 11).

The examiner respectfully disagrees, because, like the formant detection, because Table 1 (as well as 2 and 3) represent the allowable frequencies for a signal input to inputs A and B mentioned in (col. 10, lines 55-67). This “divides” the frequency spectrum for a musical signal (e.g., the intermediate frequency signal) for input B (in Figure 8) into a set of frequency bands because B has set allowable values equally spaced, and so it has a number of bands containing those allowable values for the

Art Unit: 2626

music signal. Therefore, the bands exist in the B input and so the division between bands exists. Since the claim does not recite “dividing a second input musical tone signal spectrum into separate portions of the spectrum, each portion occupying a specific frequency band”, or something to that effect, then the claim scope is not limited to what applicant intends. Applicant presumably intends to do what is conventionally done in conventional subband coders which is that a number of frequency-band-specific filters are applied to an input signal to obtain subband-specific spectra.

Applicant then argues that Katoh modifies center frequencies, and so does not teach dividing into frequency bands (Amendment, page 11). The examiner respectfully disagrees, for reasons discussed above, specifically that the B input has defined for specific frequencies and so the implementer of the system has already divided the frequency signal by specifying specific values for the input.

Applicant then argues that Katoh teaches modifying center frequencies, and so does not teach “setting modulation levels at the fixed center frequency of each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed” (Amendment, page 11).

The examiner respectfully disagrees, because, as discussed above in the summary of the interview, “modulation” could be interpreted as almost any alteration, generally, and so without more specific definition of what the modulation constitutes, specifying that one frequency (at the fixed center frequency) is to be changed (set) to its nearest harmonic’s value (modulation level), where the initial levels that this change

Art Unit: 2626

depends on are defined by the formant characteristics defined using key presses, etc., then Katoh reads on one interpretation of the claims. As discussed above, if applicant intends for the modulation to be some function applied to a specific value at a specific center frequency, where the function is independent of any other value not at that frequency, then further clarification of the claim language is needed, because modulation has too broad of a scope for interpretation.

Therefore, the examiner maintains similar prior art rejections to those previous presented (arguments to Claims 37 and 38 are similar to those directed to Claim 1).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4-5, 19-39 and 41-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Katoh (US 4,406,204).

As per claim 1, Katoh teaches, “a vocoder system comprising”:

“formant detection means for detecting formant characteristics of a first musical tone musical tone signal” (col. 7, lines 8-32);

“musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information” (col. 10, lines 55-67, here A input is as first musical tone signal and B input is as second musical tone signal);

“division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed” (Table 1);

“setting means for setting modulation levels corresponding to each of the frequency bands based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed” (col. 7, lines 32-53); and

“modulation means for modulating a level of a signal of each of the frequency bands based on the modulation level set in the setting means” (col. 19, lines 46-67).

As per claim 2, Katoh teaches, “wherein the formant detection means comprises a filter” (col. 7, lines 25-32, here “voice selector” is as “filter”).

As per claims 4 and 5, Katoh teaches, “wherein the division means comprises a filter” (col. 8, lines 18-30).

As per claims 19-27, Katoh teaches, “wherein the setting means sets the modulation levels based on pitch information, the formant characteristics and the formant control information” (col. 10, line 55 to col. 11, line 67).

As per claims 28-36, Katoh teaches, “wherein the setting means stores a formant change table that changes the formant non-uniformly and sets the modulation levels that correspond to each of the frequency bands based on the change table” (col. 10, line 55 to col. 11, line 67).

As per claim 41, Katoh teaches, "wherein the first musical tone signal is produced by a male voice or a female voice" (col. 6, lines 65-68).

As per claim 42, Katoh teaches, "wherein the level of the signal of each of the frequency bands modulated by the modulation means is an amplitude of the signal" (col. 7, lines 46-53).

As per claim 43, Katoh teaches, "wherein, in the modulation means, the center frequencies of the frequency bands are maintained as fixed in the division means" (Table 1).

As per claims 37-39, they are analyzed and thus rejected for the same reasons set forth in the rejection of claims 1 and 2.

As per Claim 45, Katoh teaches wherein the center frequencies of the modulated signals of the frequency bands are equal to the respective center frequencies of the frequency bands, as fixed by the division means (col. 10, lines 55-67; Figure 4b; where the shifting of frequencies maintains the values at the center frequencies).

As per Claim 46, Katoh teaches wherein the first musical tone signal is a speech signal ("human voice", col. 6, lines 65-68).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2626

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 6-9 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh as applied to claims 1 above, and further in view of well-known prior art.

As per claims 3, 6-9 and 40, Katoh does not explicitly teach Fourier transform. Applicant's admitted prior art teaches well-known Fourier transform. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Fourier transform in the invention of Katoh to detect formant and to dividing frequency band because that would be a conventional way to detect the formant conveniently.

5. Claims 10-18 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh as applied to claim 1 above, and further in view of Suzuki et al. (US 5,691,496).

As per claims 10-18 and 44, Katoh does not explicitly teach, set the modulation levels by interpolation processing based on the formant characteristics and the formant control information. However, Suzuki teaches set the modulation levels by interpolation processing based on the formant characteristics and the formant control information (col. 8, lines 6-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use interpolation as teaches by Suzuki because Suzuki teaches his invention provides a well balanced synthesized musical tone is output (Abstract).

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC YEN whose telephone number is (571)272-4249. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2626

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EY 11/17/08

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2626